

NextGEN

Spring 2017

for General Aviation

Get Equipped
with ADS-B

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REBATE

Helps Operators Equip Now



**Federal Aviation
Administration**

Have you reserved your ADS-B REBATE yet?

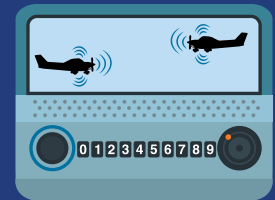
To be eligible for a REBATE,
your aircraft must meet these requirements*



Aircraft is U.S. registered



Fixed-wing single-engine
piston driven aircraft



Aircraft not currently
equipped with Version 2
ADS-B Out

— ADS-B — REBATE

faa.gov/go/rebate

*Complete program rules available at <http://www.faa.gov/nextgen/equipadsb/rebate/>



U.S. Department of Transportation

Federal Aviation Administration

800 Independence Avenue, SW
Washington, DC 20591

faa.gov/nextgen



faa.gov/go/equipADSB

Cover photo: courtesy of Textron

ADS-B Rebate Helps Operators Equip

Avoid possible repair station backlog by installing now

Tens of thousands of general aviation pilots are already enjoying added safety benefits, enhanced situational awareness and more peace of mind from Automatic Dependent Surveillance–Broadcast (ADS-B) long before the 2020 deadline to equip.

To encourage more aircraft operators to equip soon and avoid long waits for installation at repair shops as the deadline nears, the FAA is offering — for a limited time — a \$500 rebate for completed ADS-B installations in fixed-wing, single-engine piston aircraft. Equipping sooner rather than later also will help in case there is a problem with the installation and allow time to fix errors that affect performance and compliance.

Most general aviation and all commercial aircraft will require ADS-B Out, which transmits information about a plane's altitude, speed and location to air traffic controllers and to nearby equipped aircraft.

Some general aviation aircraft owners may not recognize the consequences of waiting to install ADS-B Out until they discover that they cannot easily fly out of their home airport.

“Some pilots of aircraft based near Class B or C airports may find they did not anticipate the impact of the FAA's ADS-B rule when it takes effect in 2020,” said Rune Duke, Aircraft Owners and Pilots Association (AOPA)



To claim a rebate after ADS-B is installed, an aircraft must be flown for at least 30 minutes in airspace that will require ADS-B Out.

director of government affairs for airspace and air traffic. “If they fly in Class B or C airspace or in the Mode C veil, they need to be equipped.”

To complete an ADS-B installation before the January 1, 2020, deadline, aircraft owners should research available equipment and schedule an installation. Appointments will become more difficult to obtain as the deadline approaches. Visit the Equip ADS-B website (faa.gov/go/equipadsb) to research eligible equipment and learn more about the ADS-B Out rule.

Rebates are still available and are being issued first-come, first-served until 20,000 are claimed or until the end of the one-year program. Eligible aircraft owners can reserve a rebate until Sept. 18, 2017, the program's last day to accept reservations, if any are left.

Owners of U.S.-registered, fixed-wing, single-engine piston aircraft that require an onboard pilot and are not currently equipped with Version 2 of ADS-B Out are eligible for the rebate. Eligibility also is limited to the purchase of new, TSO-certified ADS-B equipment that is compliant with the ADS-B Out rule. Owners also can claim the rebate for installing an integrated system that includes optional ADS-B In, which enables pilots to receive subscription-free traffic and weather information in the cockpit and see the location of nearby aircraft. Software upgrades of existing equipment, the purchase and installation of used equipment, and installations in aircraft first registered after January 1, 2016 are ineligible.

Find an installer and determine the specific aircraft requirements to ensure

Continued on page 8



Adrian Eichhorn demonstrates the Lynx ADS-B unit in his Bonanza.

BENEFITS

Get Equipped with ADS-B

Professional pilot advises fellow aviators not to wait

Adrian Eichhorn is passionate about aviation. When he isn't flying as a first officer with JetBlue based out of Boston, he's flying his 1962 P35 Beechcraft V-Tail Bonanza based at Manassas Regional Airport, close to his home in Northern Virginia.

Eichhorn bought the Bonanza in 1988 and has completely rebuilt it over the years, doing most of the work himself. The effort included a completely rebuilt engine, a specially modified large cargo door, and a custom-designed avionics panel with Automatic Dependent Surveillance–Broadcast (ADS-B) Out and In.

Eichhorn is a huge believer in the numerous safety benefits of ADS-B Out and In.

“My passion in life is flying,” said Eichhorn, who is also an airframe and power plant mechanic — he was the 2016 FAA National Maintenance Technician of the Year — and served

as an engineer in the Army Corps of Engineers. “I looked at the capability of the L3 Lynx NGT-9000 ADS-B unit and realized I could get continuous subscription-free weather. That's unprecedented in a [general aviation] aircraft. Even though weather is available through Stratus on an iPad, having this subscription-free service and all the other products that are offered with ADS-B Out and In — that's priceless.”

The touchscreen Lynx NGT-9000 offers four models, each with a complete ADS-B package. The Lynx NGT-9000 series provide 1090ES (Mode S Extended Squitter) ADS-B Out as well as 1090 MHz and 978 MHz (UAT) ADS-B In. This gives the pilot ADS-B traffic including Automatic Dependent Surveillance–Rebroadcast (a client-based service that relays ADS-B information transmitted by an aircraft broadcasting on one link to aircraft equipped with ADS-B In on the other link), as well as Traffic Information Services–Broadcast and Flight Information Services–Broadcast input. The weather display includes METARs, AIRMETs, SIGMETs and



Adrian Eichhorn flies over Normandy, France, in his 1962 P35 Beechcraft V-Tail Bonanza.

Next Generation Weather Radar information overlaid on a moving map. The unit also displays winds aloft, temperatures aloft, NOTAMS and TFRs.

“The quality of the graphic display on the ADS-B unit is amazing,” Eichhorn said. “It’s full-color and very easy to read. Like most avionics on a general aviation aircraft, it’s small because of the limited panel space. But with Bluetooth, I can put the display on my iPad.”

Eichhorn is adamant that pilots should equip with the optional added benefits of ADS-B In.

“The ADS-B products enhance safety to the greatest degree I’ve seen since I started flying in the 1980s — not just the weather display you are given but the picture of traffic in the area — especially flying in and out of airports without radar,” he said. “For those pilots who only have ADS-B Out and not In, they are really missing out.”

According to Eichhorn’s contact at Park Rapids Avionics, which helped him install ADS-B on his Bonanza, many customers initially were reluctant to comply with the ADS-B mandate. But once the installation was complete, no customers said that the installation was a waste of money. Quite the contrary: They quickly realized all the safety benefits ADS-B offers.

Eichhorn added that repair stations have become quite proficient with ADS-B installations, which minimizes aircraft downtime.

AROUND THE WORLD IN FIVE WEEKS

Before signing on with JetBlue about 10 years ago, Eichhorn served as a pilot for the FAA, NASA, General Dynamics and the Washington Redskins. He loves flying the Airbus A320 for JetBlue as much as he loves flying his personal aircraft.

Early in 2016, he completed a solo around-the-world trip in his Bonanza — a five-week, 163-hour voyage of more than 23,000 nautical miles made possible by rigorous planning, reliable avionics with plenty of redundancy, and lots of help from friends. The longest leg, Honolulu to Oakland, took about 17 hours and was made possible by his tip-tank modification, giving him 200 more gallons of fuel. He overcame several challenges along the way: a non-functioning autopilot during one of the longest legs, a headset that did not work on one leg, and \$26 per gallon fuel in the United Arab Emirates — plus a \$1,000 “handling” fee in Dubai.

The flight was something he wanted to do for a long time. “You have things you want to do? Go do them,” Eichhorn told AOPA.

Speaking of getting things accomplished, Eichhorn urges his fellow pilots to equip with ADS-B as soon as possible. If pilots are waiting to install ADS-B because they think that the cost will come down any lower than it already is, he said that will probably not be the case.

“Flying a general aviation airplane comes with a cost. You can’t put a price on safety. The cost of ADS-B is very reasonable for what you get. I personally would not wait. It’s making the entire National Airspace System safer.

“Your situational awareness with ADS-B is so much better. Your flight will be more enjoyable. You are doing a huge disservice to yourself and your fellow pilots by waiting.” ✈️



Eichhorn completed a solo trip around the world in his ADS-B-equipped Beechcraft Bonanza.

Frequently Asked Questions

What is required before registering for the FAA's ADS-B rebate?

The rebate reservation form requires the N-number of the eligible aircraft, make and model of the ADS-B equipment planned for installation, as well as the scheduled installation date. The rebate reservation software checks for aircraft eligibility using data from the FAA Civil Aircraft Registry.

Where do I go to make a reservation?

The ADS-B Rebate Reservation System is available at the ADS-B Rebate website: faa.gov/go/rebate.

Why is the FAA requiring that aircraft must be flown in the airspace defined in 14 CFR 91.225 for a minimum of 30 minutes?

This type of flight is essential to validate that the new avionics were installed properly and are rule compliant. The rebate program targets pilots who generally fly in the designated rule airspace.

What do I need to do if I have received my PAPER report but did not get my incentive code?

Aircraft owners should allow 24 hours to receive the email from noReplyADSBRbate@faa.gov containing the PAPER and General Aviation Incentive Requirements Summary reports. Aircraft owners should check their spam and junk email folders before contacting the ADS-B Rebate Program Office. If the reports are not received within 24 hours, aircraft owners should email ADSBRbateHelp@faa.gov and provide the aircraft tail number and date of the validation flight in Zulu time (UTC+0). The ADS-B Rebate Program Office will manually check the database for the flight information.

Why is eligibility limited to TSO-certified equipment?

Because the rebate program is aimed at this segment of the general aviation community, only TSO-certified Version 2 equipment is eligible. The cost of TSO-certified equipment is typically higher than similar equipment that is not certified, making it less affordable for cost-sensitive customers. This program is geared to ensure full aircraft compliance to the

rule, which will ensure continuous access to the rule airspace in 2020. The FAA maintains a list of the eligible equipment at: faa.gov/nextgen/equipadsb/equipment. This list is updated approximately every month. However, avionics manufacturers have the latest status of TSO certification for their ADS-B Version 2 systems.

Why are software upgrades ineligible for this program?

The FAA Rebate Program considers a software upgrade to be an upgrade performed by personnel at an installation shop. This example is considered a software upgrade and not eligible as a new equipment installation per the program rules, which require “permanent installation of new avionics equipment.”

Software upgrades are typically much less expensive than new equipment. Because the rebate program is aimed at cost-sensitive owners who need to equip to meet the deadline, the eligibility is limited to the purchase of new ADS-B equipment after the rebate announcement.

Are aircraft with portable ADS-B Out equipment eligible for the rebate?

Aircraft using portable units that have been detected flying in the National Airspace System before Sept. 19, 2016 will not be able to reserve a rebate without first contacting the ADS-B Rebate Program Office to request eligibility. Eligibility may be granted if ADS-B Out avionics certified to FAA Technical Standard Orders are permanently installed on the aircraft. To qualify for a rebate, the aircraft owner must request consideration via ADSBRbateHelp@faa.gov. To be considered eligible, the aircraft owner is required to provide a clear picture of the portable unit and serial number.

Because there could be a delay of up to one week from the time the request is submitted via email, there is no guarantee that a rebate reservation will be available. The rebate program does not accept any responsibility for delays that are incurred during the process. The rebate program limits one rebate per portable unit.

Does a certified installer or repair station have to do the installation to qualify for the rebate?

Aircraft owners who have a standard airworthiness aircraft — for example, parts 23, 25, 27 and 29 — may have the ADS-B

equipment installed by a repair station or an appropriately licensed airframe and power plant mechanic. Owners of aircraft certificated as experimental or light sport must adhere to applicable regulations and established standards when installing ADS-B equipment.

What happens if the equipment is not installed on the scheduled date?

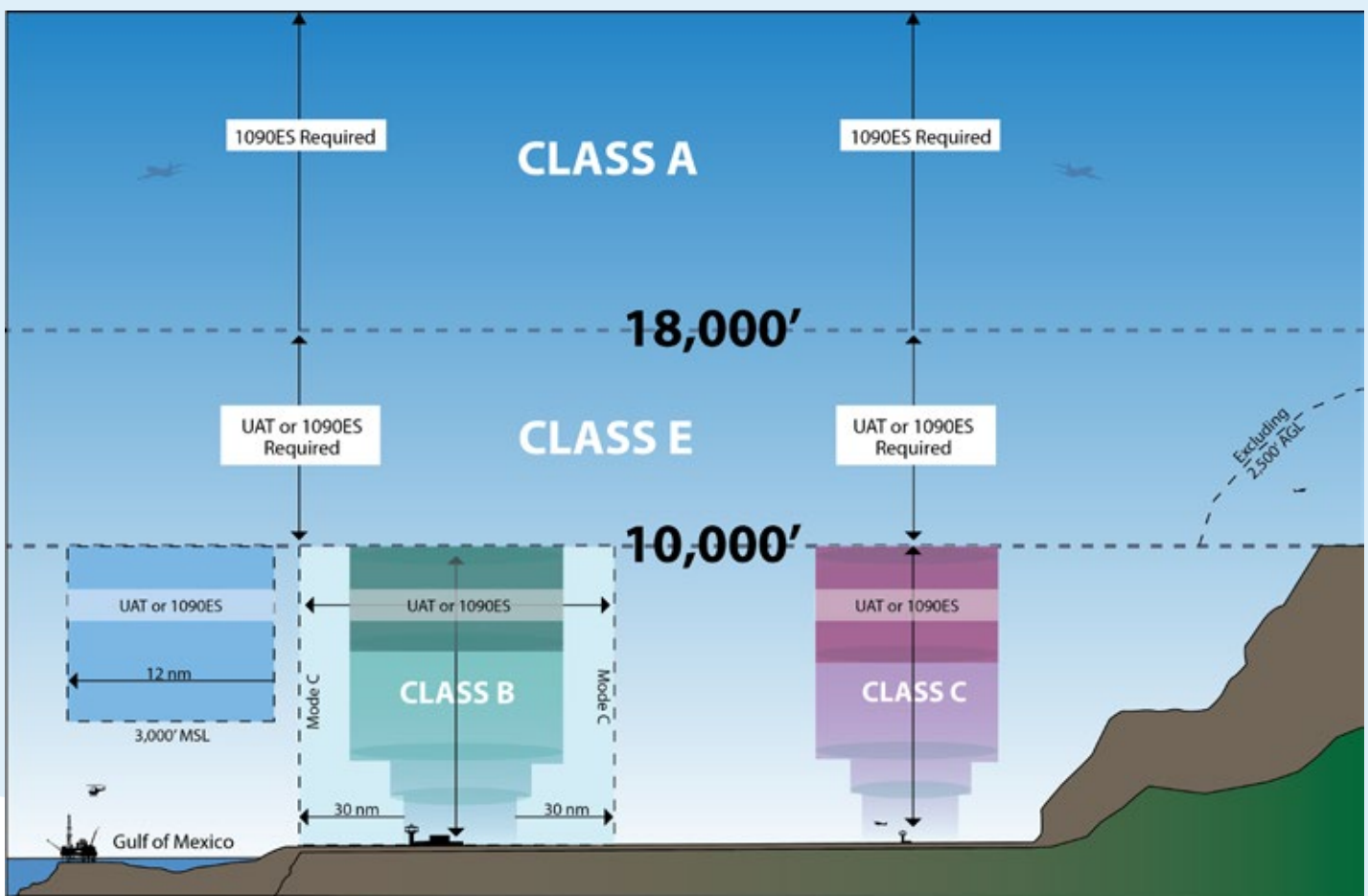
The ADS-B Rebate Program has allotted 60 days after the scheduled installation date to fly, validate and claim the rebate. This allows the owner to resolve unforeseen issues with their installation or avionics. If the rebate is not claimed within 60 days of the initial scheduled installation date, the rebate reservation will be voided and the aircraft owner will have to apply for a new rebate reservation. Please note that the FAA does not guarantee that rebate reservations will be available.

After an aircraft owner successfully claims a rebate, how long will it take to receive a rebate payment?

If the program rules have been met, an applicant will receive the payment in four to six weeks after the FAA has validated and approved the rebate claim.

How long will the rebate program run?

The program will run for one year or until the funds for all 20,000 rebates are exhausted. There are no plans to extend the program or increase the rebate. The last day to make a rebate reservation is Sept. 18, 2017, if reservations are still available. ✈️



This graphic generally depicts the airspace where ADS-B Out will be required by the rule. For more information please visit, faa.gov/nextgen/equipadsb/airspace.

ADS-B Rebate Helps Operators Equip

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that the installation will satisfy applicable FAA regulations and meet the requirements in the ADS-B Rebate program rules at faa.gov/nextgen/equipadsb/rebate/media/ADS-B_Rebate_Program_Rules.pdf.

After an ADS-B installation, an aircraft must be flown in the airspace defined in 14 CFR 91.225, the airspace that will require ADS-B Out, for at least 30 minutes to claim a rebate. This flight is essential to validate that the new avionics were installed properly and will comply with the rule requirements.

For more details about the rebate, visit the FAA's ADS-B rebate website at faa.gov/go/rebate.

INSTALLATION AND FLIGHT CHECK ISSUES

FAA data show that about 5,000 of the 32,000 ADS-B Out installations completed so far have performance problems or transmit incorrect data. Most of the aircraft with issues are single-engine general aviation aircraft.

James Marks, with the FAA's Flight Standards Service Aircraft Maintenance Division, is the ADS-B Focus Team leader and is working hard to help cut down on installation errors.

"The three most serious errors that we regularly see are transmission of a wrong ICAO code, an incorrect flight identification or call sign, and dual Out boxes using different ICAO codes," said Marks.

ADS-B has an FAA-assigned 24-bit ICAO code. This code is different from the flight identification, which should match the aircraft's N-number. The installation technician must enter this information to comply with the rule, and glitches do occur. One of the ADS-B Focus Team's highest priorities is to promptly contact any aircraft owner with incorrect ICAO codes or flight identification. The FAA handles about 200 of these cases per month. Call sign mismatch is a related issue for aircraft using a call sign instead of an N-number. This issue does not arise for the vast majority of general aviation operators, but requires allowing call sign entry for those affected.

The third issue is a twist of technology. When the ADS-B rule was first proposed, the idea was that aircraft would have to equip with either a Mode S transponder (operating on 1090 MHz) or a Universal Access Transceiver or UAT (operating on 978 MHz). Both meet the requirement for an ADS-B transmitter. To ensure that an aircraft is seen in all airspace — even outside of FAA ADS-B coverage — some aircraft owners are equipping with both device types. This approach can result in a "dual Out" problem.

"If the ICAO code in your Mode S transponder — reporting to the ground on 1090 MHz — and your UAT avionics — reporting on 978 MHz — are different, your aircraft may appear on a controller's display as two aircraft in close proximity," Marks explained. "Also, if your aircraft is equipped with ADS-B In, you may see a second aircraft displayed very close to your own position, prompting you to try to avoid an aircraft that isn't there."

The ADS-B Focus Team is also working on a reporting issue called air/ground determination. The FAA has detected ADS-B-equipped aircraft reporting in airborne mode while taxiing or stationary. This problem stems from issues with the ADS-B avionics that make the actual air/ground determination and relay that information to the FAA's ADS-B system. The FAA is working with avionics manufacturers to better understand the issue and determine how to resolve it.

FINAL STEPS

"We emphasize making sure your installation is compliant with the rule before signing off on work, because many aircraft equipped with ADS-B are operating with some type of unresolved problem," Marks said.

One way to make sure everything is good is to make certain your installer uses ground-based testing equipment. This equipment will detect most issues, but the ultimate test is to fly an aircraft in ADS-B rule airspace and request a performance report. The FAA will provide a performance report for free, usually within 30 minutes of a flight. You can request your report here: adsbperformance.faa.gov/PAPRRequest.aspx.

The performance report will tell you what, if anything, needs to be corrected. That will help you figure out who needs to fix it. In most cases, the answer is your avionics shop. ICAO codes and Flight ID are set by the installer, and any conflict between 1090/978 MHz outputs should also be corrected by the installer.

An air/ground determination failure is more complicated. Inspection by an installer is a good first step, but the culprit could also be an issue with the avionics. If the installer verifies that everything else is correct, you will need to go to the equipment manufacturer. If this source is unable to resolve the situation, please contact the FAA via email at 9-AWA-AFS-300-ADSB-AvionicsCheck@faa.gov to request a review.

This communication should include “PAPR Review Request – Air/Ground Failure” in the subject line, and you need to attach a copy of your performance report in the body of the message.

The FAA has prepared a user’s guide to help operators understand what the ADS-B Performance Report means. The guide — available at adsbperformance.faa.gov/PAPRUsersGuide.pdf — explains what each section of the report is measuring. The performance report or the opportunity to generate one is a sound means to verify correct completion of the installation work. ✈



3 Ways ADS-B In Can Protect You

Automatic Dependent Surveillance–Broadcast (ADS-B) offers general aviation pilots an unprecedented level of safety and situational awareness, assuming their aircraft are equipped with the proper avionics.

The traffic picture displayed in ADS-B In-equipped aircraft includes other planes' position information reported by ADS-B Out as well as radar. These data are sent to the cockpit via air-to-air reception or relayed from the ground. ADS-B Out's roughly once-per-second broadcast rate is not only automatic, but also depends on equipment on the aircraft for air traffic surveillance — thus ADS-B's cooperative and dependent nature.

General aviation aircraft owners who equip with ADS-B In enjoy more benefits than just having ADS-B Out. Aircraft equipped with Universal Access Transceivers (UAT) operating on a frequency of 978 megahertz (MHz) can receive and display weather and other aeronautical information from FAA broadcasts. This information enhances pilots' situational awareness of in-flight hazards and helps prevent accidents.

Pilots of ADS-B In-equipped aircraft benefit from three types of FAA broadcast services:

Traffic Information Service–Broadcast (TIS-B): This air traffic advisory service provides the altitude, ground track, speed and distance of aircraft flying in radar contact with controllers and within a 15-nautical-mile (nm) radius, as far as 3,500 feet above or below the receiving aircraft's position. General aviation aircraft equipped with ADS-B In can also receive position data directly from other aircraft broadcasting on the same ADS-B Out frequency. In addition, TIS-B enables pilots to see aircraft equipped with transponders flying nearby even if those are not equipped with ADS-B Out.

Automatic Dependent Surveillance–Rebroadcast (ADS-R): ADS-R takes position information received on the ground from UAT-equipped aircraft and rebroadcasts it on the 1090 MHz frequency. Likewise, ADS-R rebroadcasts 1090 MHz data to UAT users. In concert with TIS-B, ADS-R provides



Pilots equipped for ADS-B In can see the positions of other aircraft reported by ADS-B Out and radar on a cockpit display.

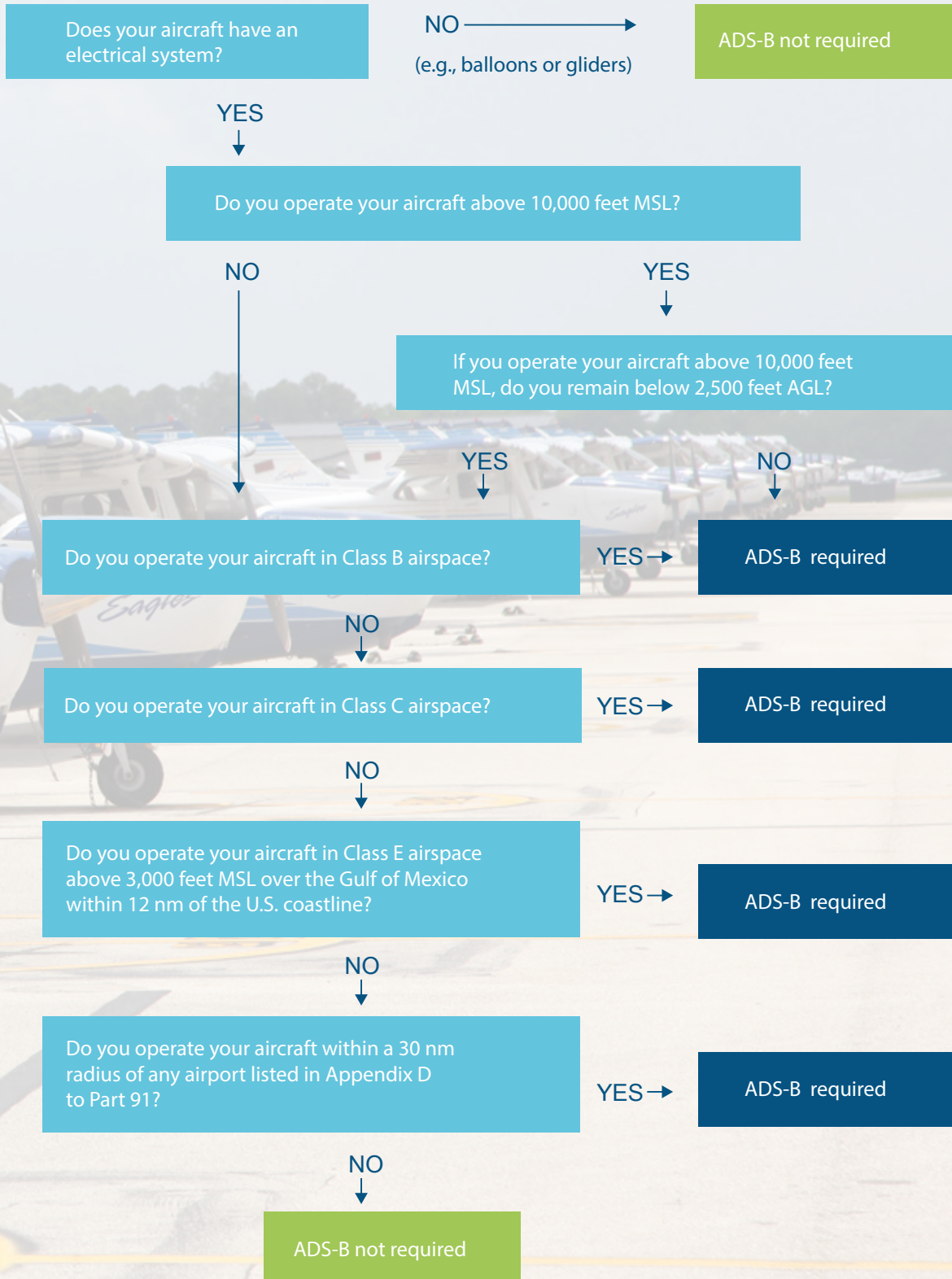
all ADS-B In-equipped aircraft with a comprehensive airspace and airport surface traffic picture. ADS-R delivers traffic data within a 15-nm radius 5,000 feet above or below the receiving aircraft's position.

Flight Information Service–Broadcast (FIS-B): This service broadcasts graphical weather to the cockpit based on what ground-based weather radar is detecting. In addition, FIS-B broadcasts text-based advisories including Notice to Airmen messages and reports on everything from significant weather to thunderstorm activity. UAT-equipped general aviation aircraft can receive this information at altitudes up to 24,000 feet.

The FAA has installed hundreds of ADS-B ground stations, making TIS-B, ADS-R and FIS-B services available across the United States. That makes ADS-B In an attractive option for general aviation. Aircraft owners and operators have the opportunity to be early adopters of ADS-B technology and to be among the first to take advantage of its safety benefits even before the ADS-B Out mandate takes effect on January 1, 2020.

Various manufacturers offer numerous rule-compliant avionics solutions, and the FAA has completed advisory circular guidance to help the general aviation community install the required avionics. ✈️

Do I Need to Equip with ADS-B?



—ADS-B— EQUIP NOW!

**DON'T
GET
LEFT** **IN THE
HANGAR**



By January 1, 2020, you must be equipped with **ADS-B Out** to fly in most controlled airspace.

Experience a new level of situational awareness:

- ▶ Weather
- ▶ Traffic
- ▶ TFRs
- ▶ NOTAMs

See and be seen. **#ADSB**

—ADS-B—
EQUIP NOW!

FOR MORE INFO VISIT
faa.gov/go/equipadsb



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